

THE "EDGE EFFECT" IN *SCHIZOCOSA OCREATA*
(ARANEAE: LYCOSIDAE):
A REASSESSMENT

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INTRODUCTION

The relationship between local spider distribution patterns and environmental factors has been studied in a variety of species (Nørgaard 1951; Dondale et al. 1969; Hallander 1970; Edgar 1971; Riechert 1974, 1976; Uetz 1976; Dondale 1977). Aspey (1976) stated that *Schizocosa ocreata* (Walckenaer) (formerly *crassipes*; Dondale and Redner 1978) was found in aggregations along a woodland-field ecotone, and suggested that unique microclimatic conditions and social interactions among conspecifics occurring within this area resulted in an "edge effect" for this spider's distribution. He termed *S. ocreata* an "edge" species, implying it was found almost exclusively along ecotones. We were skeptical of Aspey's (1976) conclusions, since previous literature and prior experience with this species led each of us to the separate conclusion that *S. ocreata* is a forest-dwelling spider (Kaston 1948; Dondale and Redner 1978; Uetz 1976; Cady (in prep.)). In addition, Aspey's (1976) survey for *S. ocreata* appeared incomplete, as he did not report sampling within the adjacent woodland or field. Considering Aspey's (1976) elaborate behavioral arguments based on assumptions about the distribution of this species, we felt further study was necessary.

METHODS

The study site was approximately 3.5 km west from Aspey's (1976) site. Three areas were sampled: A mixed hardwood deciduous woodland (*Quercus* sp., *Liriodendron* sp., *Fraxinus* sp., *Fagus* sp.), the adjoining ecotone, and an open goldenrod-thistle field (*Solidago* sp., *Cirsium* sp.). Spiders were sampled by twelve pitfall traps of the type described by Uetz and Unzicker (1976). Three were set in the

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woodland, four in the ecotone, and five in the field. The trap contents were collected seven times between 13 May and 21 June 1977.

RESULTS

More male *S. ocreata* were captured than females ($\chi^2 = 109.87$, 1df, $P < 0.001$), probably because this time of year was the breeding season for *S. ocreata*, and male lycosids are more motile than females (Vlijm and Richter 1966; Hallander 1967). Unequal numbers of males, females, and total (males + females) spiders were found across all three habitats (woods, ecotone, field) due to the relatively low number of spiders found in the field (Table 1). The number of males and total number of spiders did not differ between the woods and ecotone; the greatest number of females were found in the woods (Table 1).

Table 1. Numbers of male, female, and total *Schizocosa ocreata* found in woods, ecotone, and field. Underlined values indicate equality (Chi-square test for Goodness-of-Fit $P > 0.05$). All Chi-square tests were adjusted for sample size (n_i).

	WOODS $n_i=3$	ECOTONE $n_i=4$	FIELD $n_i=5$
MALES	<u>58</u>	<u>83</u>	29
FEMALES	12	<u>6</u>	<u>6</u>
TOTAL	<u>70</u>	<u>89</u>	35

DISCUSSION

Our data indicates that the distribution of *S. ocreata* was not restricted to the ecotone, as there was no difference between the number of spiders found in the woods and ecotone. Fewer spiders, however, were found in the field as compared to the other areas, probably due to the lack of cover and to temperature/mositure extremes in this habitat. Cady (in prep.) worked with a dense population of *S. ocreata* that was found deep within a woodland site not far ($< 50\text{m}$) from Aspey's (1976) study site. The spiders in the

woods were found in leaf litter (depth 4–6 cm) and under a herbaceous “microcanopy” immediately adjacent to a spring seepage, while the spiders along Aspey’s ecotone were in a depressed area where leaf litter and moisture collected. The greatest number of spiders in the present study were found in areas with similar characteristics. Such microhabitats provide both soil moisture and protective cover (i.e., herbaceous growth and leaf litter). In addition, deep litter may also provide the high prey density needed for egg production by females (Uetz 1975, 1979).

Tietjen (1979) suggested that airborne pheromones may be involved in attracting *S. ocreata* to particular areas for courtship and copulation. Such pheromones might be expected to collect under the leaves occupied by the relatively sedentary females. This may explain the denser concentrations of this spider and the social attractions Aspey (1976) proposed. We therefore agree with Aspey’s premises that microclimate and possible social attractions are determining factors for *S. ocreata*’s pattern of local distribution; however these microclimates or areas of congregation are not unique to ecotones, and *S. ocreata* should not be termed an “edge” species.

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